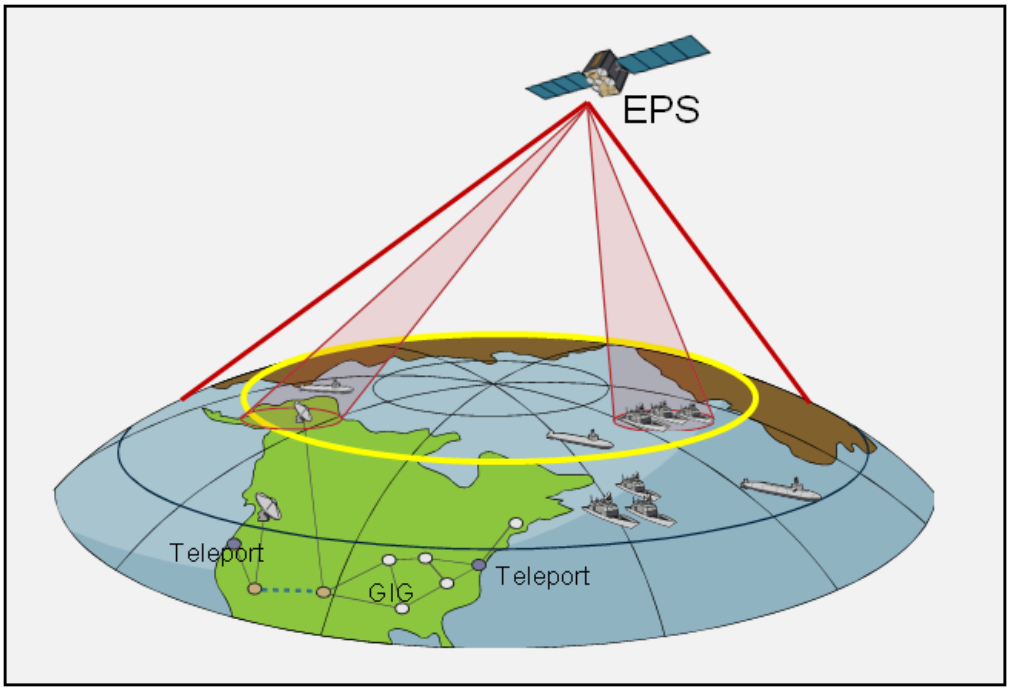
Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-121



Enhanced Polar System (EPS)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President’s Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

Enhanced Polar System (EPS)

DoD Component

Air Force

Responsible Office

Mr. Robert Tarleton
MILSATCOM Systems Directorate
483 N. Aviation Blvd.
El Segundo, CA 90245

robert.tarleton@us.af.mil

Phone: 310-653-9001
Fax: 310-653-9636
DSN Phone: 633-9001
DSN Fax: 633-9636
Date Assigned: February 10, 2014

References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 30, 2014

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated April 30, 2014

Mission and Description

The Enhanced Polar System (EPS) provides continuous protected communication (low probability of interception and detection) over the north polar region using two communications payloads on classified host satellites in highly elliptical Molniya orbits.

EPS is composed of four segments: the eXtended Data Rate (XDR) Payload (integrated onto a classified host), the User Terminals (acquired separately by the users), the Gateway (a fixed installation), and the Control and Planning Segment (CAPS) (another fixed installation). The Payload segment provides protected Extremely High Frequency communications in the north polar region. The Terminal segment provides the communication link to the EPS users. The Gateway segment provides connectivity between the north polar users and the mid-latitude users via the Defense Information System Network / Global Information Grid. CAPS acts as the Satellite Operations Center with command and control, mission and crypto planning, test and sustainment, training, ephemeris, and key distribution workload.

Executive Summary

The Air Force program manager is responsible for fielding three (Control and Planning Segment (CAPS), Payload Segment, and Gateway Segment) of the four EPS segments as well as an integrated EPS capability.

CAPS:
CAPS completed all software development and test activities for Increment 1 (of 2) in September 2015, verifying ~50% of the CAPS software requirements. All Increment 2 software development activities completed in September 2015. Increment 2 Software Item Qualification Test (SIQT) began in October 2015 and will continue through 2nd Quarter FY 2016. Upon completion of Increment 2 SIQT events, CAPS will proceed with factory segment test verification, followed by Site Acceptance Test (SAT) at Schriever Air Force Base, Colorado by 3rd Quarter CY 2016. In addition, the EPS program office fielded a Telemetry & Command - Terminal (T&C-T), as part of CAPS, in December 2015 at the Clear Air Force Station (AFS), Alaska Gateway site. This terminal transmits telemetry and command for CAPS-to-payload interactions.

Payload Segment:
Two payloads were acquired with a classified host per the EPS ADM dated December 8, 2007. Both flight payloads are developed, tested, declared acceptable, and shipped to the host facility. The first payload completed satellite integration and test and became operationally available in March 2015. The second payload was removed from storage in October 2014 to begin integration and test on the host platform.

Gateway Segment:
The Gateway Segment completed hardware installation at Clear AFS, Alaska, and Camp Roberts, California; Installation Qualification Test was successfully conducted for both sites in November 2015. During the test, the Gateway team transmitted simulated two-way user traffic from the Gateway Terminal interface (polar users) to the Teleport interface (mid-latitude users) utilizing the Defense Information System Network fiber optics transport infrastructure. The T&C-T hardware was installed at Clear AFS, Alaska and its interface with the resident CAPS equipment successfully tested. The Gateway Segment and the T&C-T are now ready to support System Tests.

The Payload and Gateway segments are nearly complete and no significant acquisition decisions remain.

Terminal Segment:
The Navy Multiband Terminal is the only EPS-compatible terminal which is funded and fielded by the Navy. The Navy has successfully contacted the EPS payload from a shore test facility, ship test facility, and submarine test facility, as directed by the Naval Undersea Warfare Center in November 2015. The Time Division Multiple Access Interface Processor, which is the Navy internet protocol network baseband equipment, demonstrated that it is compatible and inter-operable with the EPS payload.

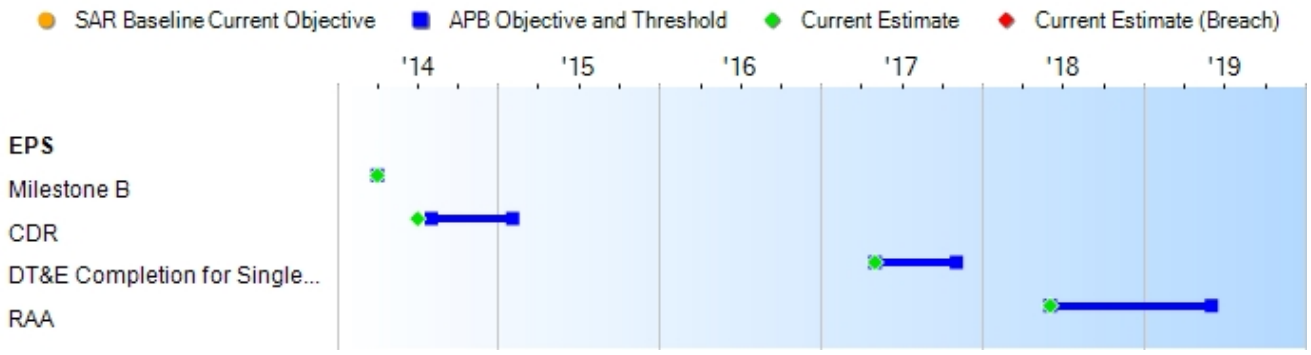
There are no significant software-related issues with this program at this time.

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Schedule



Schedule Events				
Events	**SAR Baseline Development Estimate**	**Current APB Development Objective/Threshold**		**Current Estimate**
Milestone B	Apr 2014	Apr 2014	Apr 2014	Apr 2014
CDR	Aug 2014	Aug 2014	Feb 2015	Jul 2014
DT&E Completion for Single String	May 2017	May 2017	Nov 2017	May 2017
RAA	Jun 2018	Jun 2018	Jun 2019	Jun 2018

Change Explanations

None

Notes

DT&E Completion for Single String will include one Hosted Payload, T&C-T, CAPS, and the Gateway system with the one NMT as defined by Section 12.0 of the EPS CDD dated September 15, 2011 in support of IOC.

RAA is the date two hosted payloads, T&C-T, CAPS, and the Gateway system with the three NMTs are available for operational use per Section 12.3 of the EPS CDD dated September 15, 2011, in support of FOC. The RAA date follows the completion of MOT&E including the required reporting following the test. The threshold date margin of one year is due to the uncertainty of availability of operational U.S. Naval assets in the north polar region to support MOT&E, and the availability of payload #2 by the host satellite.

Acronyms and Abbreviations

CAPS - Control and Planning Segment
CDR - Critical Design Review
DT&E - Developmental Test and Evaluation
IC2 - Interim Command and Control
MOT&E - Multiservice Operational Test and Evaluation
NMT - Navy Multiband Terminal
RAA - Required Assets Available
T&C-T - Telemetry & Command - Terminal

Performance

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Coverage				
Provide continuous 24-hour coverage anywhere from 65° North latitude to 90° North latitude and CONUS.	Provide continuous 24 -hour coverage anywhere from 65° North latitude to 90° North latitude and CONUS.	Provide continuous 24-hour coverage anywhere from 65° North latitude to 90° North latitude.	TBD	Provide continuous 24-hour coverage anywhere from 65° North latitude to 90° North latitude and CONUS.
Capacity				
EPS shall have an 18 Mbps capacity to support the CCDR's mission capabilities in the North Polar Region.	EPS shall have an 18 Mbps capacity to support the CCDR's mission capabilities in the North Polar Region.	Provide the capacity to support the CCDR's minimum mission capabilities in the North Polar Region.	TBD	EPS shall have an 18 Mbps capacity to support the CCDR's mission capabilities in the North Polar Region.
Protection - AJ				
Provide anti-jam protection against the medium probability far-term fixed and transportable jammers.	Provide anti-jam protection against the medium probability far -term fixed and transportable jammers.	(T=O) Provide anti-jam protection against the medium probability far-term fixed and transportable jammers.	TBD	Provide AJ protection against the medium probability far-term fixed and transportable jammers.
Protection - LPI/LPD				
LPI/LPD - Satisfy CEVR require-ments.	LPI/LPD - Satisfy CEVR require-ments.	(T=O) LPI/LPD - Satisfy CEVR require-ments.	TBD	LPI/LPD - Satisfy CEVR requirements.
Operational Management - Users				
Provide users a capability to plan, control, and reconfigure their assigned resources.	Provide users a capability to plan, control, and reconfigure their assigned resources.	(T=O) Provide users a capability to plan, control, and reconfigure their assigned resources.	TBD	Provide users a capability to plan, control, and reconfigure their assigned resources.
Operational Management - System				
Plan, configure, monitor, manage and control the payload, network and terminal resources.	Plan, configure, monitor, manage and control the payload, network and terminal resources.	(T=O) Plan, configure, monitor, manage and control the payload, network and terminal resources.	TBD	Plan, configure, monitor, manage and control the payload, network and terminal resources.
Net Readiness				
100 percent of	100 percent of	100 percent of	TBD	100 percent of interfaces;

interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements in the Joint integrated architecture.	interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements in the Joint integrated architecture.	interfaces; services; policy-enforcement controls; and data correctness, availability and processing requirements designated as enterprise-level or critical in the Joint integrated architecture.		services; policy-enforcement controls; and data correctness, availability and processing requirements in the Joint integrated architecture.
Interconnectivity				
The EPS system Gateway(s) shall simultan-eously provide continuous access to the rising and descending EPS payloads during communi-cations payload availability and simultaneous access to a GIG point of presence.	The EPS system Gateway(s) shall simultan-eously provide continuous access to the rising and descending EPS payloads during communi-cations payload availability and simultaneous access to a GIG point of presence.	(T=O) The EPS system Gateway(s) shall simultan-eously provide continuous access to the rising and descending EPS payloads during communi-cations payload availability and simultaneous access to a GIG point of presence.	TBD	The EPS system Gateway(s) shall simultaneously provide continuous access to the rising and descending EPS payloads during communications payload availability and simultaneous access to a GIG point of presence.

Requirements Reference

Capability Development Document (CDD) dated September 15, 2011

Change Explanations

None

Acronyms and Abbreviations

AJ - Anti-Jamming
CCDR - Combatant Commander
CEVR - Circular Equivalent Vulnerability Radius
CONUS - Continental United States
EPS - Enhanced Polar System
GIG - Global Information Grid
LPD - Low Probability of Detection
LPI - Low Probability of Intercept
Mbps - Megabits per second
O - Objective
T - Threshold

Track to Budget

RDT&E				
Appn		**BA**	**PE**	
Air Force	3600	04	0603432F	
Project			**Name**	
644052			Polar Satellite Communications	(Sunk)
Air Force	3600	05	0605432F	
Project			**Name**	
657105			Polar Satellite Communications	

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2014 $M			BY 2014 $M	TY $M		
	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Development Objective	Current Estimate
RDT&E	1389.1	1389.1	1528.0	1380.3	1338.5	1338.5	1334.2
Procurement	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flyaway	--	--	--	0.0	--	--	0.0
Recurring	--	--	--	0.0	--	--	0.0
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1389.1	1389.1	N/A	1380.3	1338.5	1338.5	1334.2

Current APB Cost Estimate Reference

Service Cost Position dated January 28, 2014

Confidence Level

Confidence Level of cost estimate for current APB: 59%

The Life-Cycle Cost Estimate confidence level of 59% Research, Development, Test, and Evaluation and Operations and Support reflects the expected value, or mean, of the cost estimate distribution. It takes into consideration relevant risks, including ordinary levels of external and unforeseen events, aiming to provide sufficient resources to execute the program under normal conditions encountering average levels of technical, schedule, and programmatic risk and external influence.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	2	2	2
Procurement	0	0	0
Total	2	2	2

Quantity Notes

The two EPS payloads are funded by RDT&E. EPS has no procurement funding or quantities.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	1187.0	71.9	50.8	24.5	0.0	0.0	0.0	0.0	1334.2
Procurement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	1187.0	71.9	50.8	24.5	0.0	0.0	0.0	0.0	1334.2
PB 2016 Total	1190.4	72.1	51.3	24.7	0.0	0.0	0.0	0.0	1338.5
Delta	-3.4	-0.2	-0.5	-0.2	0.0	0.0	0.0	0.0	-4.3

Funding Notes

The prior year funding does not include the Interim Polar System, consistent with the approved scope of the EPS program.

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	0	0	0	0	0	0	0	0	0
PB 2017 Total	2	0	0	0	0	0	0	0	0	2
PB 2016 Total	2	0	0	0	0	0	0	0	0	2
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	6.0
2007	--	--	--	--	--	--	34.0
2008	--	--	--	--	--	--	171.8
2009	--	--	--	--	--	--	220.8
2010	--	--	--	--	--	--	246.5
2011	--	--	--	--	--	--	131.7
2012	--	--	--	--	--	--	97.8
2013	--	--	--	--	--	--	77.2
2014	--	--	--	--	--	--	101.4
2015	--	--	--	--	--	--	99.8
2016	--	--	--	--	--	--	71.9
2017	--	--	--	--	--	--	50.8
2018	--	--	--	--	--	--	24.5
Subtotal	2	--	--	--	--	--	1334.2

Annual Funding 3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2014 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	6.8
2007	--	--	--	--	--	--	37.6
2008	--	--	--	--	--	--	186.5
2009	--	--	--	--	--	--	236.4
2010	--	--	--	--	--	--	260.6
2011	--	--	--	--	--	--	136.7
2012	--	--	--	--	--	--	99.7
2013	--	--	--	--	--	--	77.5
2014	--	--	--	--	--	--	100.4
2015	--	--	--	--	--	--	97.8
2016	--	--	--	--	--	--	69.4
2017	--	--	--	--	--	--	48.1
2018	--	--	--	--	--	--	22.8
Subtotal	2	--	--	--	--	--	1380.3

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

None

Nuclear Costs

None

Unit Cost

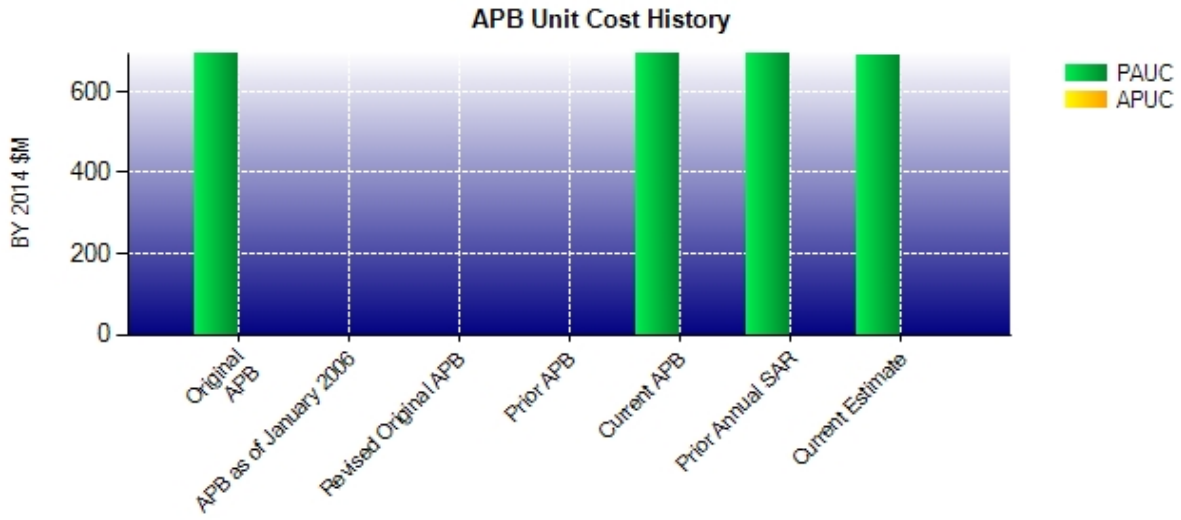
Unit Cost Report

Item	BY 2014 $M Current UCR Baseline (Apr 2014 APB)	BY 2014 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	1389.1	1380.3	
Quantity	2	2	
Unit Cost	694.550	690.150	-0.63
Average Procurement Unit Cost			
Cost	0.0	0.0	
Quantity	0	0	
Unit Cost	--	--	--

Item	BY 2014 $M Original UCR Baseline (Apr 2014 APB)	BY 2014 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	1389.1	1380.3	
Quantity	2	2	
Unit Cost	694.550	690.150	-0.63
Average Procurement Unit Cost			
Cost	0.0	0.0	
Quantity	0	0	
Unit Cost	--	--	--

The PAUC is based on RDT&E cost and quantities only. There is no APUC for this program because there are no procurement funds or quantities.

Unit Cost History



Item	Date	BY 2014 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Apr 2014	694.550	N/A	669.250	N/A
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	N/A	N/A	N/A	N/A	N/A
Current APB	Apr 2014	694.550	N/A	669.250	N/A
Prior Annual SAR	Dec 2014	691.500	N/A	669.250	N/A
Current Estimate	Dec 2015	690.150	N/A	667.100	N/A

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
669.250	2.150	0.000	0.000	0.000	-4.300	0.000	0.000	-2.150	667.100

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.000	--	--	--	--	--	--	--	--	0.000

An APUC Unit Cost History is not available, since no Initial APUC Estimate had been calculated due to a lack of defined quantities.

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Apr 2014	N/A	Apr 2014
Milestone C	N/A	N/A	N/A	N/A
RAA	N/A	Jun 2018	N/A	Jun 2018
Total Cost (TY $M)	N/A	1338.5	N/A	1334.2
Total Quantity	N/A	2	N/A	2
PAUC	N/A	669.250	N/A	667.100

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	1338.5	--	--	1338.5
Previous Changes				
Economic	+5.8	--	--	+5.8
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-5.8	--	--	-5.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	--	--	--
Current Changes				
Economic	-1.5	--	--	-1.5
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-2.8	--	--	-2.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-4.3	--	--	-4.3
Total Changes	-4.3	--	--	-4.3
CE - Cost Variance	1334.2	--	--	1334.2
CE - Cost & Funding	1334.2	--	--	1334.2

Summary BY 2014 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	1389.1	--	--	1389.1
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-6.1	--	--	-6.1
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-6.1	--	--	-6.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-2.7	--	--	-2.7
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-2.7	--	--	-2.7
Total Changes	-8.8	--	--	-8.8
CE - Cost Variance	1380.3	--	--	1380.3
CE - Cost & Funding	1380.3	--	--	1380.3

Previous Estimate: December 2014

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-1.5
Revised estimate for transfer of funds to Small Business Innovative Research/Small Business Technology Transfer. (Estimating)	-3.3	-3.4
Revised estimate due to Congressional General Reductions in FY 2016. (Estimating)	-0.2	-0.2
Revised estimate due to inflation adjustment (Estimating)	-0.2	-0.2
Adjustment for current and prior escalation. (Estimating)	+1.0	+1.0
RDT&E Subtotal	-2.7	-4.3

Contracts

Contract Identification

Appropriation: RDT&E

Contract Name: EPS CAPS

Contractor: Northrop Grumman Information Systems (NGIS) Corporation

Contractor Location: One Space Park
Redondo Beach, CA 90278

Contract Number: FA8808-13-C-0001

Contract Type: Cost Plus Incentive Fee (CPIF), Cost Plus Fixed Fee (CPFF)

Award Date: November 30, 2012

Definitization Date: November 30, 2012

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
66.8	N/A	1	157.6	N/A	1	144.9	156.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercise of CLIN 0002 for software development and delivery, CLIN 0003 for initial spares and support equipment, CLIN 0010 for special studies, and CLIN 0011 for Key Management System to Protected Key Management Architecture upgrade.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	-6.4	-1.7
Previous Cumulative Variances	+1.4	-0.4
Net Change	-7.8	-1.3

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the application of unplanned resources to several software and System Engineering, Integration and Test efforts: Software Installation Qualification Test readiness activities for both Increment 1 and 2 testing; additional software integration testing recommended by a joint Government/NGIS Tiger Team; unplanned CAPS/Payload interface integration activities; added effort for test environment configuration; updates to the test tools needed for requirements verification; and unplanned Information Assurance and Security Technical Implementation Guide effort in the database and software environment. Based on performance trends, the NGIS cost variance (-$7.8M) is unrecoverable. However, the Program Office will evaluate options to modify remaining scope and limit the potential for future cost growth. NGIS sacrificed cost to maintain schedule and meet the contractual schedule incentive fee requirement of Site Acceptance Test (SAT) at Schriever Air Force Base (AFB), Colorado in April 2016.

The unfavorable net change in the schedule variance is due to software development and testing delays relative to the baseline in Increment 1, causing ripple effects to initial Increment 2 activities. NGIS sacrificed cost to maintain schedule and meet the contractual schedule incentive fee requirement of SAT at Schriever AFB, Colorado in April 2016. To date, no critical path schedule impacts have been realized. However, parallel segment and system level tests from 1st Quarter to 4th Quarter FY 2016 increase the risk of critical path impact and further cost growth on CAPS. Any delay will also impact system level test events and could result in additional cost increases to other EPS segments.

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	0	0	2	0.00%
Production	0	0	0	--
Total Program Quantity Delivered	0	0	2	0.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	1334.2	Years Appropriated	11
Expended to Date	1174.1	Percent Years Appropriated	84.62%
Percent Expended	88.00%	Appropriated to Date	1258.9
Total Funding Years	13	Percent Appropriated	94.36%

The above data is current as of February 25, 2016.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 28, 2014
Source of Estimate:	SCP
Quantity to Sustain:	1
Unit of Measure:	System
Service Life per Unit:	10.00 Years
Fiscal Years in Service:	FY 2018 - FY 2028

The EPS system is defined as two payloads plus ground components. The Quantity to Sustain is one EPS system.

Sustainment Strategy

The EPS sustainment strategy follows a path that is consistent with the product acquisition strategy. Current sustainment approach is to have Contractor Logistics Support (CLS) for each segment with planned Performance Based Logistics / Public Private Partnership contract for the Gateway and the Control and Planning Segment (CAPS). The Gateway segment is acquired through the Space and Naval Warfare Systems Command (SPAWAR) Systems Center-Pacific (SC-PAC). The Gateway also includes the Telemetry & Command - Terminal (T&C-T) designed by Massachusetts Institute of Technology / Lincoln Lab (MIT/LL). Northrop Grumman Information Systems Corporation was selected through a competitive process to design and develop CAPS. The Payload segment is a subset of Advanced Extremely High Frequency (AEHF) payload capabilities, provided by the AEHF payload contractor, Northrop Grumman. The Terminal segment employs the Navy Multiband Terminal (NMT) by the user community as the only EPS-compatible terminal. Support for each of these segments maps back to the applicable Government or contractor agencies.

The support concept for the T&C-T, CAPS and Gateway employs both organizational and depot maintenance. The operators and maintainers for the T&C-T, CAPS and Gateway will be contractors. Depot support for the T&C-T is the responsibility of MIT/LL, and depot support for the Gateway is the responsibility of SSC-PAC. For CAPS, the EPS depots are as follows:

• Ogden Air Logistics Center, Hill Air Force Base (AFB), Utah for software maintenance or public private partnership

• Tobyhanna Army Depot, Pennsylvania for hardware maintenance

• Cryptologic and Cyber Systems Division, Lackland AFB, Texas, for cryptologic items

Interim Contractor Support will be employed for all maintenance and operations until system IOC expected in 2018. Post IOC, operations and organizational level-maintenance will be provided by the operational unit through CLS, and depot-level maintenance support will be provided in accordance with the final Depot Source Of Repair.

Antecedent Information

Interim Polar System (IPS) consists of three Low Data Rate Milstar packages on three classified host satellites as an expedited, interim solution for protected connectivity requirements in the north polar region. Two satellites with hosted packages are required to provide the necessary 24-hour coverage. Since the first IPS was no longer operational, the third package went into operations in November 2008 to sustain the 24-hour coverage.

Comparable O&S cost estimates for the antecedent system, IPS, are not available. The requirements of IPS vary significantly from EPS, making a cost-only comparison between the systems very misleading. The technical differences between the fielded capabilities will be vast. EPS supports an eXtended Data Rate terminal fleet consisting of NMTs,

which can utilize both EPS and AEHF. This reduces the Navy platform footprint and support tail, providing a corresponding reduction in Navy O&S costs. EPS will support a current cryptographic architecture and the accompanying key planning, management, and distribution infrastructure. EPS is therefore positioned to address a modern and evolving cyber threat.

Annual O&S Costs BY2014 $M		
Cost Element	**EPS Average Annual Cost Per System**	**IPS (Antecedent) Average Annual Cost Per System**
Unit-Level Manpower	5.300	--
Unit Operations	0.000	--
Maintenance	1.800	--
Sustaining Support	2.200	--
Continuing System Improvements	6.100	--
Indirect Support	0.300	--
Other	0.000	--
Total	15.700	--

Item	Total O&S Cost $M			
	EPS			IPS (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	157.4	173.1	157.4	N/A
Then Year	189.4	N/A	189.4	0.0

Equation to Translate Annual Cost to Total Cost

Total O&S Costs = service life per system * number of systems * unitized cost

Total O&S Costs = 10 year design life * 1 EPS System * $15.7M

O&S Cost Variance		
Category	**BY 2014 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2014 SAR	157.4	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	157.4	

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2014 $M): Total costs for disposal of all System are 0.0